# COMP 430/533
# Introduction to Databases
# Fall 2018

## Contact Information
Instructor: Risa Myers
Office: Duncan Hall 2062
Email: rbm2@rice.edu
Office Hours: TBD in Duncan Hall 2062.

## Course Objectives
This course is an introduction to relational and other database systems, SQL programming, Database application programming, and Database design.

The main goals of this course are to:
1. Understand the benefits of using a database
2. Become familiar with database systems and terminology
3. Create well-designed databases and understand trade-offs
4. Develop proficiency in effectively managing data in a database

## Prerequisites
There are no formal prerequisites for this course. However, students should have basic programming skills. There will be programming assignments in the course.

## Textbook
There is no required textbook for the class, although “Database Systems: The Complete Book” by Garcia-Molina, Ullman, and Widom is recommended. Occasional handouts will be provided.

## Meeting Times and Locations
Class will be held Mondays, Wednesdays, and Fridays from 2:00 PM to 2:50 PM in Duncan Hall 1070.

## Registration
You’re responsible for registering for COMP 430/533 with the university registrar. Comp 430 and Comp 533 may not both be taken for credit.

## Lectures
The planned lecture schedule is:
1. COMP 430/533 introduction
    a. Logistics

    b. Tools
    c. Introduction to relational databases
2. Relational Calculus
3. Relational Algebra
4. Declarative SQL 1
5. Declarative SQL 2
6. Declarative SQL 3
7. Data Definition Language & Data Manipulation Language
8. Data Modeling & Business analysis
9. Entity Relationship Diagrams 1
10. Entity Relationship Diagrams 1
11. Data Normalization 1
12. Data Normalization 2
13. Quiz 1 - SQL
14. Imperative SQL 1
15. Imperative SQL 2
16. Imperative SQL 3
17. Indexing 1
18. Indexing 2
19. Indexing 3
20. Views & Security
21. Quiz 2 – Data Modeling
22. Transactions 1
23. Locks
24. Logs
25. No SQL 1
26. No SQL 2
27. No SQL 3
28. No SQL 4
29. Data Warehouses 1
30. Data Warehouses 2
31. Quiz 3 – Transactions, No SQL
32. Query Tuning
33. Query Optimization 1
34. Query Optimization 2
35. Wrap up

## Communication

The class will have a Piazza forum for all day-to-day communication:

piazza.com/rice/fall2018/comp430533f18/home

It is expected that if you have a technical question on an assignment, you will post it to the forum rather than sending an email to the instructor. This guarantees a fast response and means that everyone can benefit from the question and the answer. In general, only inquiries of private or personal nature

should be made directly to the instructor ("I need to go out of town on Oct 22nd, can I have an extra day..."). Everything else should be posted on Piazza. You'll get faster feedback from the group than you can get from your instructors.

If you have any communication of a more personal nature and wish to contact the instructor of the class, please email me, and include the word "430" or "533" in the subject line. Please realize that I get a lot of random email, so if you do not include 430/533 in the subject line, your email will likely be ignored.

Assignment handouts and submissions, as well as your grades, will be on Canvas (https://canvas.rice.edu). The discussion forum will be on Piazza.

## Grading and Evaluation

COMP 430
Assignments: 70% of grade
In class quizzes: 30% of grade

COMP 533
Project: 15% of grade
Assignments: 55% of grade
In class quizzes: 30% of grade

Your numeric grades will be available to you in Canvas.

Final grades are based on the numeric grades, where 90-100 is an A, 80-89 is a B, and so forth. I reserve the right to apply a "curve" to change this, but only for the better. That is, if you've gotten 90%, you're guaranteed at minimum an A- for your final grade, but you might do better.

## Class Attendance

Attendance will not be taken in class, but you are highly encouraged to attend and participate in class.

## Assignments

This is an assignment-oriented class. There will be 6 assignments, all completed individually, except for A3, which will be done in pairs. There will also be 3 quizzes. For A3, one solution will be provided by each pair and both team members will receive the same grade.

The assignments are expected to be:

| Assignment # | Description | Out | In |
|---|---|---|---|
| A1 | SQL queries 1 | 08/31/2018 | 09/09/2018 |

| | | | |
|---|---|---|---|
| A2 | SQL queries 2 | 09/10/2018 | 09/17/2018 |
| A3 | Entity Relationship Diagram | 09/19/2018 | 10/05/2018 |
| A4 | Database creation and queries | 10/10/2018 | 10/21/2018 |
| A5 | Imperative SQL | 10/22/2018 | 11/04/2018 |
| A6 | NoSQL (MongoDB) | 11/07/2018 | Date of class final |

## Graduate Student Project

Graduate students will complete a course project in teams of 2-3 students. The goal of the project is to design and build a database that contains data of interest to you and write a set of queries, stored procedures, and functions that allow you to either manipulate the data or interpret it. An example and list of milestone deadlines will be provided during the first week of classes.

## Late Assignment Policy

Assignments must be turned in by 11:55PM (5 minutes before midnight) on the due day. You can turn in an assignment up to 24 hours late, in which case you receive a 10% penalty (that is, 10 points are subtracted from an assignment that is worth 100 points), or up to 48 hours late, in which case you receive a 20% penalty. Assignments turned in after that time will not be accepted. Please note that your submission time is whatever Canvas says, and your submission is whatever you turn into Canvas, no exceptions. Be safe; submit early and often! Though I say no exceptions, there are exceptions in very extreme circumstances, with proper documentation. For example, if you obtain a doctor/dentist note stating that you were so ill at the due date/time that you could not reasonably be expected to meet the deadline, it is possible to get an extension.

For reasonable reasons (e.g. I've got 2 term papers and 2 projects all due on the same day), due date extensions may be requested up to one week prior to the assignment due date. After that, extensions will be granted only under extreme circumstances with proper documentation, as described above.

## Regrade Requests

These must be made within one week of an assignment/quiz being returned, during my office hours, to me, in person. Sending an email does not constitute a regrade request. Posting on Piazza or Canvas does not constitute a regrade request. When you talk to me, I'll help you understand whether you've got a legitimate request. If you do, then you'll write that request down formally, print it on paper, and hand it to me. I will batch these, and then periodically issue grade

adjustments in bulk for everybody.

## Rice Honor Code

In this course, all students will be held to the standards of the Rice Honor Code, a code that you pledged to honor when you matriculated at this institution. If you are unfamiliar with the details of this code and how it is administered, you should consult the Honor System Handbook at http://honor.rice.edu/honor-system-handbook/. This handbook outlines the University's expectations for the integrity of your academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process.

## Academic Misconduct

In a programming class, there is sometimes a very fine line between "cheating" and acceptable and beneficial interaction between peers. Thus, it is very important that you fully understand what is and what is not allowed in terms of collaboration with your classmates. Our goal here is to be 100% precise, so that there can be no confusion. The rule on collaboration and communication with your classmates is very simple: you CANNOT transmit or receive code (this includes SQL statements) to or from anyone in the class in any way---visually (by showing someone your code), electronically (by emailing, posting, leaving up on a screen, or otherwise sending someone your code), verbally (by reading code to someone) or in any other way we have not yet imagined. Any other collaboration is acceptable.

The rule on collaboration and communication with people who are not your classmates (or your TAs or instructor) is also very simple: it is not allowed in any way, period. This disallows (for example) posting any questions of any nature to programming forums such as StackOverflow, or your friend from your undergrad days who now programs in SQL.

As far as going to the web and using Google, we will apply the "two line rule." Go to any web page you like and do any search that you like. But you cannot take more than two lines of code from an external resource and actually include it in your assignment in any form. Note that changing variable names or otherwise transforming or obfuscating code you found on the web does not render the "two line rule" inapplicable. It is still a violation to obtain more than two lines of code from an external resource and turn it in, whatever you do to those two lines after you first obtain them. Furthermore, you should cite your sources. Add a comment to your code that includes the URL(s) that you consulted when constructing your solution. This turns out to be very helpful when you're looking at something you wrote a while ago and you need to remind yourself what you were thinking. This rule is especially applicable when it comes to writing stored procedures, functions and triggers.

Use of electronics, of any kind (phones, laptops, tablets, etc.), is not permitted during the quizzes.

Any violations of these rules will be reported to the Honor Council. Just don't do it!

## Students with Disabilities

If you have a documented disability that may affect academic performance, you should: 1) make sure this documentation is on file with Disability Support Services (Allen Center, Room 111 / adarice@rice.edu / x5841) to determine the accommodations you need; and 2) meet with me to discuss your accommodation needs.